Coping with institutional complexity

Coping with institutional complexity: intersecting logics and dissonant visions in a nation-wide healthcare IT implementation project.[1]

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Abstract

Purpose - Digital technology transformation projects are complex, lengthy and difficult to implement, often failing to meet their objectives. Research explains this failure in terms of competing institutional logics influencing actors' responses to project demands, and points to multiple interpretations that actors collectively form about the organisational application of the technology – their "organising visions" - throughout the project. This paper examines digital transformation projects from an institutional perspective to reveal the role that multiple logics and organising visions play in shaping the projects.

Design/methodology/approach – The research adopts a qualitative single study approach, investigating a national programme aimed at delivering a unified Human Resource Information System (HRIS) across a national public health sector.

Findings – This study reveals that it is the tensions between the different components of actors' organising visions which explain their coping responses to institutional complexity and the project outcome. The findings also show how the relative influence of different logics and elements of organising vision can change as the project progresses from comprehension to implementation, and demonstrate the importance of coherence of visions within groups of actors as well as between them.

Originality/value – The analysis demonstrates the role that actors' organising vision plays in bridging between institutional logics and coping responses, thus shaping digital transformation projects. The findings indicate the need to account not only for differing institutional logics, but

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also for their changing influence as the project unfolds and actors' attention is directed onto different aspects of the organising vision.

Keywords: *digital transformation projects, IT implementation, institutional complexity, institutional logics, organising vision, human resource information systems.*

1. Introduction

Digital transformation is concerned with the adoption and use of information and digital technologies to change different aspects of an organisation, ranging from the creation of new business models, to improvements in existing organisational processes and customer experience (Berman, 2012). A key aspect of digital transformation projects is the implementation of new information technology (IT), often involving large-scale projects that are expected to achieve these transformative outcomes. Over the years, encouraged by improvements in IT capabilities, many organisations across sectors have invested in such transformative projects. Yet, despite decades of research, most new IT projects continue to disappoint, with outcomes well below expectations (Doherty *et al.*, 2012). Recent Information Systems (IS) research reports many high-profile digital transformation projects that have either been abandoned or failed to achieve their objectives (e.g. Currie, 2012; Omar *et al.*, 2017). Such reports parallel earlier studies of IT implementation projects that highlighted the unfulfilled potential of many such endeavours (e.g. Davenport and Stoddard, 1994; Zuboff, 1988). Failure to achieve the expected transformative outcomes from new IT implementation projects is often attributed to misalignments between the technology and social context (Davidson and Chismar, 2007; Orlikovski, 1992) that emerge as the implementation unfolds (Robey and Sahay, 1996). Research often points to the institutional complexity of the environment in which these projects take place to explain their unfulfilled expectations (Avgerou, 2001). Complexity arises as modern organisational environments contains multiple sets of expectations and values (Currie and Guah, 2007). Research also highlights that new technologies introduced into organisations may be understood and interpreted

differently by different groups of organisational actors, depending on their interests, power, expertise and context of use (Davidson, 2002; Orlikowski and Gash, 1994), who inscribe it with different sets of meanings, values and assumptions (Robey and Azevedo, 1994), thus developing different perceptions of the technology as the implementation unfolds (Abubakre *et al.*, 2017; Leidner and Kayworth, 2006). Faced with an unfamiliar technology, actors form their own interpretation of different aspects of the technology project, ranging from its business value and rational for implementation, to its material features and practices associated with its use (Davidson and Pai, 2004), thus collectively envisioning the application of the technology within an organisational context – its 'organising vision' (Swanson and Ramiller, 1997). Thus, to understand how IT implementation projects develop in such complex environments, we need to account for both the multiplicity of logics that shape actors' behaviour (the macro level), and their emerging envisioning of the technology project (the mezzo level) during its implementation. Just because the environment is complex, does not explain why actors pursue certain courses of actions during IT implementation. Research has shown that within complex environments, actors may often overcome tensions and achieve implementation (Berente and Yoo, 2011), whilst at other times their efforts fail and implementation is abandoned (Bunduchi *et al.*, 2015). Moreover, just because different actors form different visions of the technology as its implementation unfolds, does not explain how these visions change over time (Davidson and Pai, 2004), nor how these changes shape actors' actions vis-à-vis its implementation. Considering how actors' responses to institutional complexity relate to their evolving interpretations of the technology project may provide new insights into how IT implementation projects unfold and with what outcomes in complex environments. Given the sustained investments organisations make in large scale IT transformative projects, and the expectations for widespread improvements in organisational performance, understanding how such implementations projects unfold and with what outcomes is a key aspect of the digital transformation research agenda (Agarwal *et al.*, 2010).

To investigate this interaction, the paper examines the case of a large-scale digital transformation project concerning the implementation and roll-out of a nation-wide HRIS in the public health sector of one north European country. The project sought to digitalise and integrate all non-payroll HR activities across the country's entire public health system responding to a new government's strategy for digital integration.

The research question that guides this study is: How do digital transformation projects, involving large-scale implementation of new IT, unfold in institutionally complex organisations, where actors, developing different visions of the technology, have to cope with multiple demands and expectations? To examine actors' coping strategies and their emerging envisioning of the HRIS during its implementation, the paper draws from institutional theory, in particular the institutional logics framework. Institutional logics takes account of the social complexity of organisational environments (**multiple institutional logics**), and actors' actions to cope with such complexity (**strategic responses**) (Thornton *et al.*, 2012). To conceptualise actors' emerging interpretations of the technology project as it unfolds during implementation the paper draws from the concept of **organising vision** (Swanson and Ramiller, 1997).

The paper is organised as follows: the next section reviews research that examined how IT actors cope with institutionally complex contexts and introduces the theoretical concepts that frame this research. The paper then describes the research setting and methodology, followed by a description of the findings. The paper closes with a discussion of the findings and conclusions offering some final comments and suggesting future areas of research.

2. Theoretical background

2.1.Research on IT implementation in social complex environments

There is a large body of research that examines the role that the social context plays in explaining IS implementation. Such research draws from a range of theoretical lenses, the most common being institutional theory, cultural theory and structuration. Institutional (Mignerat and Rivard,

2009) and cultural approaches (Leidner and Kayworth, 2006) emphasize the broad set of values, norms and expectations in which organizational actors are embedded, and their role in explaining IT implementation and use in organizations. While institutional theory considers the role that cognitive, regulative and normative structures play in legitimizing behavior and explaining individual action (Scott, 1995), cultural theory focuses on the role that cognitive structures play in directing behavior (Schein, 1996). Structuration theory also examines how broad social structures constrain actors' behaviors, but contrary to cultural and institutional approaches, it emphasizes individual action (Giddens, 1984) as the key factor explaining IT implementation and use (Jones and Karsten, 2008).

Such macro level analyses of technology implementation projects in organisations highlight the need to consider the social context in which actors operate. Technologies are social objects whose meaning is created by actors operating within specific contexts characterised by particular configurations of values, meanings and assumptions (Orlikowsky, 1992). The meaning of technology is thus defined by the context (Barley, 1986), and may change over time as different actors, involved at different times, may have different interpretations about the problems the technology is supposed to solve (Kaghan and Bowker, 2001), and may form different visions about what IT represents (Abubakre *et al.*, 2017). The technology thus has "interpretative flexibility" in that the problems and solutions associated with the technology present themselves differently to different groups of actors at different times during the lifecycle of a technology project (Pinch and Bijker, 1984). As the implementation proceeds, the visions different groups of actor form about the technology evolve, leading to agreement or conflict depending on whether the IT artefact embodies values consistent with the contexts in which these different groups of actors operate (Abubakre et al., 2017). This interpretative flexibility quality of technology is critical to explain contradictory outcomes of IT change projects (Robey and Azevedo, 1994). Lack of congruence between how different groups of actors envision the new technology is

widely found to hamper its implementation and use within organisations (Davidson, 2002; Olesen, 2014), and its wider diffusion across a particular community (Currie, 2004; Swanson and Ramiller, 1997; Wang and Swanson, 2007).

This study examines the complexity of social context in a holistic manner as containing cultural, regulative and normative expectations, and considers the interaction between actors' responses to such complexity and their interpretation of the technology. Institutional theory lens allows us to capture the role that context plays in shaping individual action, while also taking a holistic view of this context (Micelotta *et al.*, 2017). The next section introduces the key institutional concepts used to frame this research: institutional logics, strategic responses and organizational vision.

2.2.Conceptual lenses: institutional logics, strategic responses and organizing vision

Institutional logics refer to the set of assumptions, values, and beliefs that underpin expectations and behaviour in organisations (Friedland and Alford, 1991). Researchers have studied how institutional logics inform different organizational actors' perceptions of and responses to the same project goals, and how actors shape such logics through their own agency (Thornton *et al.*, 2012). Examples of logics include family, market and corporation, amongst many others often coexisting within the same organisational context. Different logics involve different sources of identity, legitimacy and authority, embed different values and expectations, and encourage different behaviors and practices (Thornton *et al.*, 2012). While many logics may be represented within an organization, their likelihood to guide actors' behavior varies across actors (Binder, 2007). Organizational actors are socialized differently, through their professions, work experience or culture. Different socializing patterns explain why actors draw from different logics to inform their actions (Binder, 2007), for example managers from managerialism logics and doctors from medical professionalism logics.

There is a large body of research that examines IT implementation within institutionally plural organizations where multiple logics coexist. Such studies identify a variety of logics shaping the organisational implementation of digital transformation projects. For example, medical professionalism, managerial and market logics were found to shape the implementation of the national UK's IT programme that sought to integrate services across the UK national health systems (Currie and Guah, 2007), while managerial rationalism, professionalism, and organisational persistence characterised the implementation of a new Enterprise Resource Planning system in NASA (Berente and Yoo, 2012). The health sector in particular is fertile ground in documenting how actors involved in IT implementation projects tackle tensions among competing logics (Boonstra *et al.*, 2017; Bunduchi *et al.*, 2015; Currie, 2012; Currie and Guah, 2007; Jensen *et al.*, 2009). Such studies generally associate different groups of actors with different logics: for example, accounting and financial personnel follow managerial rationalism, project managers follow project management professionalism, scientific personnel follow the logic of scientific professionalism, while some actors draw from multiple logics, e.g. some project managers are exposed to both managerial and professional logics (Berente and Yoo, 2012). This association is generally implicitly made (e.g. Berente and Yoo, 2012; Bunduchi *et al.*, 2015), and assumed to depend on actors' different socialization patterns (Boonstra *et al.*, 2017): different logics guide the behavior of the different actors involved in IT implementation depending on the social context to which such actors are exposed: participation in different professional networks, for example scientific versus business training, means scientific and accounting personnel are exposed to different sets of values and expectations. Actors' different socialization patterns thus explain the multiplicity of logics that informs their behavior during IT implementation (Boonstra *et al.*, 2017). The presence of multiple, often competing, logics creates tensions as expectations may be misaligned across different group of actors (e.g. Currie and Guah, 2007). Tensions force actors to engage in *coping strategies* during IT implementations. For example, commercial focus on generating profit from paying customers versus professional expectations to treat customers

as patients creates tensions for commercial opticians seeking to implement a new telehealth system, which they addressed through compromising strategies (Bunduchi *et al.*, 2015).

Research identifies a variety of such coping response strategies including actors loosely coupling elements of their practices with different logics (Berente and Yoo, 2012), blending logics to develop hybrid logics (Boonstra *et al.*, 2017), translating across logics (Nielsen et al, 2014), bracketing specific cues to selectively enact particular logics (Jensen *et al.*, 2009), or alternating between strategic responses (Standing et al., 2009). Following Standing *et al.* (2009) and Berente *et al.* (forthcoming), this paper adopts Oliver's (1991) strategic responses concept to examine how actors cope with multiple logics. *Strategic responses* refer to the actions that actors may adopt to respond to pressures to behave in ways that are consistent with the perceived set of institutional norms and expectations that characterise their environment (Oliver, 1991). Oliver (1991) identified five *strategic responses*: acquiescence (conforming), compromise (attempting to balance conflicting expectations), avoidance (circumventing the need to conform), defiance (rejection or opposition), and manipulation (efforts to change the institutional expectations or influence the sources through which these expectations are exerted). Empirical studies have shown how such responses can allow individuals or sub-groups (e.g. departments) to demonstrate the legitimacy of their actions whilst also preserving their agency, often as a means of advancing their specific interests (Oliver, 1991). Oliver suggests that actors engage in different responses depending on the levels of authority and uncertainty within the organisation.

Within IS research, the concept of strategic responses has been used to explain how actors' efforts to cope with tensions among institutional expectations explain the outcome of IT implementation projects. Bunduchi *et al.* (2015) examined how actors operating at the intersection of the public – private health sector attempt to reconcile competing expectations through compromise responses. Their study found that compromise encourages different actors to develop competing visions of the technology project, leading to the failure of the IT implementation project. Standing

et al. (2009) documented the coping efforts of actors in a government agency involved in IT implementation over time through a succession of strategic responses and demonstrated how the cumulative effect of such responses explains the project's success. Standing *et al.* (2009) found, as Oliver (1991) suggested, that responses vary depending on changes in levels of authority, while Berente *et al.* (forthcoming) links variation in responses and indirectly outcomes of IT implementation to the intensity and degree of congruence between logics. Other authors examine hybridisation (Boonstra *et al.*, 2017) and translation (Nielsen *et al.*, 2014), loose coupling (Berente and Yoo, 2012), and selectivity (Jensen *et al.*, 2009) strategies and document how these coping strategies shape the outcome of IT implementation projects, such as the adoption and adaptation of standardised systems to local contexts (e.g. Berente and Yoo, 2012; Jensen *et al.*, 2009), or the failure to adopt a new system (Mangan and Kelly, 2008).

To understand how actors' interpretation of the technology shifts during the IT implementation project, the study draws from Swanson and Ramiller's (1997) '*organising vision*' concept originally developed to provide an institutional explanation of the diffusion of IT innovations. The concept refers to actors' collective understanding of the purpose of an IT innovation and the processes through which it will be embedded and utilised within organisational settings. The concept includes three core components: the *business problematic* – the organisational or economic issues that the technology aims to solve, the *core technology* - the functionality and role of the technology, and *organisational practices* - the changes needed to integrate the technology and its impact on work practices. Organising vision develops over time as the technology and actors' understanding of its possibilities co-evolve and diverse interpretations within the community coalesce around a shared set of understandings (Swanson and Ramiller, 1997). The organising vision plays a key role in driving the adoption and diffusion of a new technology by explaining how a community of actors interpret a new technology in terms of its organisational application, material features and organisational practices, by legitimising the

technology within that specific community, and mobilising resources to generate interest and support its diffusion (Kaganer *et al.*, 2010; Swanson and Ramiller, 1997). Different groups of actors develop their own vision of a new technology depending on their own interests, allegiances and contexts of use (Currie, 2004; Greenhalgh *et al.*, 2012).

Within IS research, the organising vision lens has been applied to examine the failure to implement telehealth in organisations characterised by different logics (Bunduchi *et al.*, 2015), and to successfully diffuse a new IS innovation (Currie, 2004). The concept has also been deployed to explain the successful adoption of open source software (Marsan *et al.*, 2012) and professional service automation (Wang and Swanson, 2007), as well as to reveal the strategies that organisational actors engage in to legitimate a new kind of IS innovation within an institutionally complex environment (Kaganer *et al.*, 2010). While failure is explained in terms of the inability of different groups of actors to align their interpretations of the technology (e.g. Currie, 2004) as they deal with the tensions inherent in their institutionally complex setting (e.g. Bunduchi *et al.*, 2015), successful adoption emerges through actors' efforts to deal with diverse interests by developing a consistent vision to legitimate the innovation and mobilize resources (Wang and Swanson, 2007). Existing research thus emphasises lack of coherence between the organising visions developed by different groups of actors as a key reason why a new technology fails to be adopted across a community of actors (Currie, 2004; Greenhalgh *et al.*, 2012; Swanson and Ramiller, 1997).

The framework illustrating the relationship between theoretical concepts is presented in Table 1.

Table 1. Conceptual framework informing our study

Institutional logics	Strategic responses	Organising vision
Multiple set of assumptions, values, and beliefs that underpin expectations and guide actors' behaviour including family, market, corporation, community, professional, and state. Organisational actors are guided by different logics depending on their different socialisation patterns.	Actors' coping mechanisms to respond to multiple expectations associated with multiple logics including: acquiescence; avoidance; defiance; compromise and manipulation. Actors engage in different responses depending on the nature of the institutional environment (e.g. congruence and intensity of logics). These responses shape how the IT implementation unfolds and its outcome.	Reflects a group of actors' interpretations about the technology and its applications, and emerges gradually as the implementation unfolds. This vision is informed by the institutional context in which actors are embedded, and includes: business problematic, core technology and organisational practices. Alignment between the visions formed by different groups of actors legitimise a new technology and facilitates its adoption.

Institutional theory has been criticised for emphasising the environment as the main conductor for organisational behaviour (Binder, 2007). Oliver's (1991) conceptualising of strategic responses and the development of institutional logics theory (Binder, 2007; Thornton *et al.*, 2012) have attempted to address this criticism by viewing actors not as passive carriers of institutional scripts, but as active interpreters who can adapt and create new practices. Current developments in institutional research further seek to explain how actors respond to institutional complexity (e.g. Greenwood and Suddaby, 2006) or how logics interact with practices to explain action (e.g. Smets *et al.*, 2015). These also address prior criticisms by seeing organisational actors as players that make sense of and interpret institutional expectations, and act strategically on these interpretations (Orlikowski and Barley, 2001), rather than passive followers of institutional constraints. Within this vein, the key contribution of this study is to understand how institutional complexity, and actors' efforts to cope, shape the process and outcome of IT implementation, by considering how institutional complexity affects their interpretations of the technology – the visions they form about its organisational application. By bridging between responses to institutional complexity and interpretations of technology, the study seeks to clarify the mechanisms through which institutional complexity shapes IT processes, beyond the current focus on considering coping responses.

Having identified and discussed the theoretical concepts that underpin this research and the contribution that this study seeks to bring to IS research, the next session discusses the research methods employed to address the research question.

3. Methodology

The research follows an interpretative qualitative case study design. Case studies allow access to rich and contextualized data (Yin, 2009) about actors' behaviours which aligns with this study's aim to examine actors' responses to their institutional environments, and their shifting interpretations during the technology project. The study's focus on the social context in which actors implement the technology also aligns with the interpretative approach (Walsham, 1993).

3.1. Research setting and selection

The case involves the introduction of a commercial, off-the-shelf, modular HRIS across the entire public health sector in one small north European country. The country's health system follows the Beveridge Model, with almost all healthcare services provided and financed through taxation, and a high level of government control (Reid, 2009). The government plays a critical role in controlling public spending within health, through its ministry for health where the *central national health organisation (NHO)* coordinating the health system is headquartered (including central teams such as e-health, procurement and IS). The health system is split across twenty-two *regional health organisations (RHOs),* which are separate legal entities each with their own *HR and local IS departments*. The programme's aim was to standardise and upgrade existing HR systems to improve the management and exchange of information, in line with the wider strategy for digital government services as described in Box 1. The HRIS programme was managed centrally by a *national HRIS project implementation team* based within the NHO. From initial conception to realisation, the innovation cycle studied lasted 13 years, as summarised in Table 2, and was still underway amongst late adopter sites at the time of this study.

Table 2. Historical timeline of the HRIS innovation programme

Planned Timeline	Planned activities	Actual timeline	Stages
2002	Workforce information strategy	January – November 2002	PRECURSORS TO THE HRIS PROJECT*
2004-2007	Short-medium term workforce information solution implementation	2004-2008	
2007	Outline business case	July-December 2007	COMPREHENSION
2008-2010	HRIS specification	2008 – 2010	ADOPTION
February 2010-March 2011	Standard business case & procurement	February-December 2010	
April - September 2011	National preparation, testing & training	January - October 2011	IMPLEMENTATION
October 2011-April 2012	Implementation phase 1 RHOs	November 2011 – June 2012	
April – August 2012	Implementation phase 2 RHOs	Delayed until May – November 2013	
September 2012 - February 2013	Implementation phase 3 RHOs	December 2013 – May 2014	
March – August 2013	Implementation phase 4 RHOs	June – November 2014	
Not planned	Evaluation of a pilot HRIS implementation across 3 RHOs	September 2014 - June 2015, report was supposed to be discussed in October 2015 One RHO achieved full system usage	
September 2013-February 2014	Implementation phase 5 RHOs	Planned for March - August 2016	
From March 2014	Use across all RHOs and all their users	RHO 7 - June 2015 Other RHOs - Not available	ASSIMILATION*

* Not in the scope of this study

The roll-out strategy for the HRIS followed a staggered, multi-stage approach, whereby RHOs were engaged in the implementation gradually, based on their stated readiness and motivation. To capture the implementation stages, eight RHOs were selected to represent a variety of geographies, prior experiences with HRIS systems and implementation stages (see Table 3).

Selection of RHOs was informed through consultations with the respondents in the central team and analysis of available project documentation.

Table 3. Selected RHOs

RHO	Size	Region	Existent HRIS	Stage of implementation
RHO1	Small	Rural	Yes	Implementation + pilot (inside/outside HR) + distribution of logins to users
RHO2	Large	Urban	Yes	Implementation
RHO3	Small	Urban	Yes	Implementation + pilot (HR)
RHO4	Medium	Rural	No	Implementation on hold
RHO5	Special (one hospital) [very small]	Urban	Yes	Implementation + pilot (HR)
RHO6	Medium	Rural	No	Implementation + pilot (inside/outside HR) + distribution of logins to users
RHO7	Special (non-clinical) [very small]	Urban	Yes	Finished implementation, early assimilation
RHO8	Large	Rural	Yes	Implementation + pilot (inside/outside HR)

To inform our sample selection and data analysis we drew on the four-stage model of IS innovation which has been widely deployed in institutional IS research (Mignerat and Rivard, 2009) to examine the introduction of IT in organisations. The model charts *comprehension* (preparing strategies and information), *adoption* (developing the procedures necessary to enable the programme), *implementation* (introducing the system into the organisation) and *assimilation* (system is fully embedded). The innovation stages are identified according to the activities which interviewees described as happening at each stage. As this study focuses on understanding how complexity shapes the adoption and implementation of a digital transformation programme, rather than its outcomes during use, the analysis examines actors' coping efforts during the first three stages. A brief overview of the HRIS programme and targeted modules is given in Box 1.

Box 1. Vignette of the HRIS roll-out project

At the outset of the project, multiple electronic and paper-based HR systems were in use across individual RHOs, although a standard national payroll system had already been in place. Diverse business case scenarios were comprehensively evaluated prior to choosing how to proceed such as procuring HRIS with/without payroll module. Following this process, the new HR system was envisaged as a means of integrating all non-payroll related HR activities into a national system, to be interfaced with the existing national payroll system. A public procurement exercise led to a successful bidder from an international IT vendor offering an off-the-shelf HRIS developed by a large, American system provider. The selected HRIS was already used by large organisations around the world, mostly in the private sector, and the IT vendor was well known to the NHO, having provided other national-level IT services. A small central national implementation team (including between 4-12 employees at different stages during the project) was set up in the following year (by reforming the pre-existing NHO workforce information solution project team). Its remit included working with the vendor to shape the technical solution, and supporting the RHO-based teams during the implementation of the system. Most technical implementation activities were delegated to these local teams, with RHOs being expected to dedicate resources to support them. The HRIS included Core HR, Employee Relations, Self-service, iRecruitment, Learning Management and HR analytics modules. Rollout was scheduled across five staggered phases over a three year period, whereby different groups of RHOs (4-5 per phase) would gradually initiate their implementation activities. Each phase was planned to last circa six months (see Table 2), however the project was extended due to operational delays. The project encountered significant resource constraints during its lifecycle which significantly altered its initial scope. At the time of data collection only one RHO had fully integrated the new system, while the implementation process was still underway in most RHOs. A few RHOs had postponed implementation and were scheduled to begin at the beginning following an independent HRIS evaluation. While the study took place during this intermediate phase, the programme to achieve full implementation was still underway at the time of writing.

The selection of the case was informed by the intensity criterion, to consider cases which provide access to richer data about the phenomenon (Miles and Huberman, 1998). The healthcare sector is well known by its institutional complexity, populated by multiple groups with various commercial, political, professional and institutional allegiances, which place different values on the use of technologies, and combine interests aligned with professional norms for clinical quality with conflicting managerial demands for efficiency (Currie and Guah, 2007; Greenhalgh *et al.*, 2012). IT implementation projects, especially on a large scale, in the healthcare context are notoriously problematic, facing multiple tensions and conflicting response strategies (Currie, 2012), with new technologies often failing to achieve a coherent organising vision across the community (Greenhalgh *et al.*, 2012). The selection of a large-scale implementation project in the healthcare sector was thus likely to provide access to a case where the complexity of the environment and the variety of visions actors form throughout the IT implementation project was likely to be more intense. Moreover, the case was selected at the point when the challenges involved in its implementation were evident. The literature links challenges to the presence of

institutional complexity and misaligned interpretations, and the researchers expected that the case was likely to exhibit both phenomena. The intense manifestation of a phenomena offers the researchers the opportunity to access rich data (Miles and Huberman, 1998).

3.2.Data collection

Data were collected during the latter implementation stages in 2015 (see Table 2) and involved 25 semi-structured interviews with 31 actors from the NHO and eight RHOs involved in the comprehension, adoption and implementation of HRIS (19 individual and six group interviews); and internal and publicly available documentation covering the lifetime of the project. The retrospective interviews, supplemented with contemporaneous documentation, asked respondents to recall their experience of the project since its beginning in 2007 up to the moment, thus covering the entire period of the project. Table 4 in the appendix shows the respondents, their location within the national health system, and the stages of the project in which they were involved. Respondents were selected to represent all the key actors involved in the project (e.g. NHO including central HRIS implementation team, procurement and eHealth teams, and RHOs including the local HR departments and the local HRIS implementation teams involving the local HR and occasionally IS professionals). Within these categories, selection was based on respondents' knowledge of and involvement with the HRIS project throughout its life time: the respondents including project participants recommended by the project's national lead, snowball sampled from contacts suggested during the interviews or who proactively volunteered to participate in our research. Interview data and documentary analysis (see Table 5 in appendix) were triangulated for cross-verification and to provide a rich picture of users' experiences and the wider context in which the project took place.

Retrospective methods of data collection are criticized for suffering from respondents' faulty memory and attempts to cast past behavior in a positive light. To address these problems, this research followed Miller *et al.*'s (1997) suggestions for improving the validity of retrospective

accounts by: (1) using a semi-structured interview guide to provide interviewees with opportunities for free discussion and contextualization of the events recalled; (2) asking interviewees to recall things that happened and what they have done during the preparation, developing and subsequent roll-out of the HRIS, thus requiring them to recall past events and actions, rather than asking for their beliefs at the time; and (3) triangulating between multiple informants (31 interviewees), and between multiple sources of data: retrospective interviews and contemporaneous project documentation.

3.3.Data analysis

Data analysis followed Miles and Huberman's (1998) approach including iterative movements between coding, involving moving gradually between descriptive, interpretative and pattern coding, and literature review to facilitate interpretation of data and the emergence of themes. The analysis began with open coding of transcripts, what Miles and Huberman call descriptive coding, to elicit preliminary categories, using respondents' own terminology (Gioia *et al.*, 2013). To facilitate inter-coder consistency, two researchers independently coded one of the richest transcripts and then iteratively reviewed their emergent codes to resolve conceptual or interpretive ambiguities.

Analysis then moved on to interpretative stage, involving searching for thematic patterns and relationships, as well as refining the coding framework. This included an iterative process of going back and forth from the data to the literature to explore concepts, seek interpretations and identify characteristic patterns in actors' behaviour and the IS innovation process overall. During the interpretative stage, the concept of government expectations, later associated with the public-sector logic, first emerged as a powerful explanation for changes in the process during its comprehension and adoption. This finding prompted the researchers to explore institutional approaches as a means of enriching the interpretive framework for our observations. Further iteration between data and literature revealed other institutional lenses through which to examine

the data, in particular *institutional logics* (to explain the configurations of different institutional expectations during different innovation stages); *organising vision* (to explain the actors' perceptions concerning the objectives, content and processes of the innovation); and *strategic responses* (to explain the changes in the actors' behaviours vis-à-vis the innovation during its life cycle). The data was then revisited and re-coded with reference to these three themes during the three innovation stages covered: *comprehension*, *adoption* and *implementation*. The relation between the open codes, the interpretative meta-codes (*logics*, *vision*, *responses)* and the final patterns emerging from the data are shown in Table 6 and discussed according to the innovation stages in the following sections. Table 7 includes the final data structure and exemplary quotes.

Table 6. Summary of results

Stages & strategic responses	Coherence amongst the components of the emerging organising vision	Prevalence of institutional logics	Outcome as envisaged HRIS
Comprehension: Acquiescence	Coherent vision around a system that allows better management of HR processes, delivers high quality health care, supports the government agenda, and aligns with best practices in the industry [**business problematic**], supported by standardised and interoperable technologies [**core technology**], and by consistent practices that assume staff as end-user [**organisation practices**].	Public sector as dominant logic, and corporate, professional and market as subordinate logics guiding behaviour.	HRIS envisaged as standardised and interoperable system to cover all the HR activities outside payroll and to reflect best practices in the sector.
Adoption: Compromise	Shift in vision which reflects emerging contradictions between the need for HR centric, customisable solution with fewer specifications [**core technology**], but a narrower scope of application [**business problematic**], and assume procurement through limited procurement but developed through extensive consultative processes [**organisation practices**].	Public sector and corporate logics as dominant logics, with professional and market as subordinate logics guiding behaviour.	Off the shelf HRIS developed for a different context (US private sector) that requires some customisation to reflect the specificity of its application context (public sector, healthcare, country specific).
Implementation: Acquiescence Avoidance Defiance Compromise Manipulation	Focus on clarifying the practices involved in the implementation, including the de-prioritisation of investment in HRIS, the rationalisation of implementation resources, and the parallel use of new and old HR systems in RHOs during the implementation of the new system [**organisation practices**]. Re-positioning the HRIS as a generic management system (rather than HR) to leverage wider support, and changes in the expectations that the new HRIS will not adequately support the delivery of HR services to internal clients [**business problematic**]. Such practices come in conflict with the earlier expectations around a national system that conforms to industry best practices, and delivers a wide range of benefits across quality of care, HR processes and government agenda.	Public sector, corporate, market and professional as dominant logics guiding behaviour.	An off the shelf HRIS which requires significant customisation efforts to work within the specific context of the public sector healthcare sector, and involving a much narrower scope of applications than originally envisaged.

Table 7. Data structure and exemplary quotes

Open coding categories (*with exemplary quotes*)	**Interpretative codes**	**Final categories**
Government expectations for accurate workforce data: "*There was a real desire for consistent and accurate workforce information from [the Government]*." (R1) [Quote IL-PS1]	Public-sector logic	Institutional logics
Government vision for shared HR services: "*The overall directives come from the [Government] and they're looking to have shared services within HR, so we all need to be working off the one system and working in the same way."* (R27, R30) [Quote IL-PS2]		
Government vision for digital integration: *"The key driver for a system was to have a system that would allow HR and payroll systems to speak to each other."* (R10) [Quote IL-PS3]		
Government expectations to reduce spending across public sector: "*Now the [NHO] has been cut back, cut back, cut back, as all public sector have, and there isn't this spare capacity. Well I don't think there ever was but there isn't even the opportunity to find any spare capacity or even go and ask for additional funding because the answer is quite firmly no, there is no extra money. So again, your hands are tied by the kind of financial pressures of doing a big project within a public sector.*" (R1) [Quote IL-PS4]		
Expectations to comply with the public sector regulations on equality and diversity: "*There are so many guidelines and regulations that the [NHO] puts in place and probably public sector does this around equality, around the ability of managers to do recruitment and so on and so forth.*" (R1) [Quote IL-PS5]		
The concern for efficient management "*At the time, the system was brought in to improve quality and effectiveness within the HR community. So ultimately that's what everybody bought into is having a consistent high quality system that allowed them to have just in time information*" (R10) [Quote IL-CL1]	Corporate logic	
The concern for efficient management of a highly diverse organisation: "*I would say that there was a degree of difficulty because you've got [large number of RHOs] with different systems currently in use. So to merge all the systems to a system that suits all the [RHOs] and all the processes and systems then I think the range now of the specification became quite wide.*" (R15) [Quote IL-CL2]		
Expectations to align with industry best practices: "*I suppose if you look across industry, most large scale organisations would have an HR system and we didn't.*" (R10) [Quote IL-ML1]	Market	

Expectations to differentiate from their closest competitor: "*So we then worked on a specification for the national HR system and what we did was we stole with pride the [other EU country] specification for their scheme and we worked on that and we [localized] that."* (R1) [Quote IL-ML2]	logic	
RHOs expectations for improving the provision of HR services to their employees "*All employees care about is their annual leave. They don't care about anything else… So, if we can't get that – you know, if we can't give that to them, then….There's no point in it.*" (R27-R30) [Quote IL-ML3]		
Expectations that health workers data would serve to monitor statutory registration of medical professions: "*So if you're a doctor, you must be registered with the [Professional Medical Association]. If you're a nurse, you must be registered with the [Professional Nursing Association] and so it goes on.*" (R1) [Quote IL-PL1]	Profession logic	
The norms for consensus based decision making: "*That's the way we work in the [NHO], it's no different to this project. So at the end of the day we're very consultative…You can't buy a product and then insist that [all RHOs] will bring it in without any buy in and consultation. So no matter what you do, if you're bringing in a national project you need to get all your actors to agree to it. So that's not a criticism you would expect there to be dialogue and consultation and engagement and people tied into it.*" (R10) [Quote IL-PL2]		
Expectations to prioritize clinical eHealth systems: "*More investment, understandably, is placed on the clinical systems….*" (R14) [Quote IL-PL3]		
The new HRIS will serve to solve the problem of statutory reporting: "*It should enable us to get some really good reports about the organisation and its workforce.*" (R10) [Quote OV-BP1]	Business problematic	Organising vision
The new HRIS will solve the problem associated with the lack of interoperability between the different HR systems operating within RHOs: *"What I would say is, and this has been one of the fundamental things from the start, is that the system itself was required to integrate with a number of other national feeds".* (R2) [Quote OV-BP2]		
The new HRIS will increase the efficiency of HR processes through standardising processes across individual sites: "The recruitment process is quite complex but it's also we also have challenges within recruiting clinicians and folk all around [the country], so it was really bringing in a standardised way of doing that, but it was efficient and efficient and could work quickly for both people applying for jobs but also people who were managing the process of recruitment." (R4) [Quote OV-BP3]		
The new HRIS will improve team management and recruitment: "*Basically for the manager to have full access to their team's terms, conditions, absence, training – things like that. So that's the kind of main benefits.*" (R18) [Quote OV-BP4]		
The new HRIS would address the recruitment capacity problem and enable better workforce planning: "*Recruitment in the [NHO] is absolutely top priority at the moment. We really struggle to get people in, we've got real recruitment shortages, staff shortages and things like that.*" (R2) [Quote OV-BP5]		
The scope of the new HRIS to address HR management problems is narrower: "*The scope was too wide, even when we cut it down, it was going to be expensive. And we cut it, it was quite easy through discussion with our HR directors to say 'right, we'll take that out, we'll take that out, we'll take that out and this is what we'll then go for'.*" (R1) [Quote OV-BP6]		

The new HRIS is a management wide system that can support better quality of care: "*We keep promoting the fact that [new system] is not an HR system; that it's actually a management system*." (R14) [Quote OV-BP7]		
The new HRIS is unable to support their ability to deliver HR services to their internal clients: "*And when the people at the bottom are saying, 'Oh, it doesn't work', that goes up the chain; they then come to meetings and go, 'Well, I've been told it doesn't work.' And you're going, 'But why?' and they're going, 'Well, I've been told it doesn't work.' But the damage is done, because they sit in a meeting saying, 'It doesn't do this.' And even if you say, 'Er, stop a minute. It does actually do that', all the people round the table have heard is 'it doesn't do that'*." (R2) [Quote OV-BP8]		
The new system will consist of one single system across all RHOs: "*HR experts got together and thought instead of having individual systems that didn't really talk to each other, we should have one national system*." (R5) [Quote OV-CT1]	Core technology	
The new system will allow no customisation to individual RHOs requirements: "*We also didn't want any ability for [RHOs] to be able to tweak their bit of the system to what they wanted and then find of course it doesn't actually match up with the data in all of the other [RHOs] because unfortunately, across an organization like this, there are [many] variations of the truth if you like. So [RHOs] will implement things in their own way, they have slightly different procedures, they interpret the regulations slightly differently, they apply them slightly differently*." (R2) [Quote OV-CT2]		
The new system will rely on technology solution that was successfully implemented in other complex and large organizational setting: *"If you look at the "system supplier" system, the "system supplier" product has been very successful…You know, there's some large organizations with-, and there's some worldwide organizations who just have the "system supplier" product and it works."* (R10) [Quote OV-CT3]		
The system will interface with the national professional medical association systems: *"To have an interface from the [Professional Medical Association] to update the doctors' registrations."* (R1) [Quote OV-CT4]		
The new system will have few system specifications and be based on the off-the-shelf core technology specification: *"We went through this process and we came to the point where the options narrowed down and it came down to buying an off-the-shelf HR system and bolting it onto payroll."* (R1) [Quote OV-CT5]		
The new system requires some limited customisation to comply with legislation requirements: *"I kept saying to "the vendor" and to "system supplier", you know, 'we're special but we're not that special and what we are asking you for here in our view is actually illegal - it's legislative for us and therefore it must be legislative for everybody else' and when you buy the "system supplier" system, it's set up as a global worldwide system and you get it set up for the legislation in your part of the world…, but still they said 'no that's not how it's built' and I had difficulty with that on a personal level, because I thought well for goodness' sake how on earth."* (R1) [Quote OV-CT6]		
The new system will involve some customisation to address the needs of the NHO / individual RHOs: "*They had the specification and then obviously the system they bought was just an off the shelf system that they just put the basic package and then obviously they needed to customise it to meet with the needs of all the [RHOs in the country]*" (R15 & R16) [Quote OV-CT7]		

The system would be HR centric: *"The other issue was that we actually have a payroll system that works and is national and if you were implementing a new system we'd actually get caught up in implementing the payroll part of it to ensure that people were paid and the HR part of it, which is the bit we really wanted, would be second-rate, and that's what happened in [a neighbouring country]…, [but] they had a number of different payroll systems, which we didn't have, and so that led to us getting to the point of saying 'well look, let's get an HR system and link to payroll."* (R1) [Quote OV-CT8]		
The system would be used directly by staff: *"The whole point about [new HRIS] is that every employee will use [it]."* (R4) [Quote OV-OP1]	Organizational practices	
Changes in the procurement practices from open to restricted procurement: *"So at that point, we started looking at the invitation to tender, then all tendering process and you can either do an open procurement or a restricted procurement and we decided that because our spec was quite tight, we would go for a restricted procurement, which should have cut down on the time that it took to go through the procurement process."* (R1) [Quote OV-OP2]		
Extensive consultation process involved in eliciting system requirements across different categories of actors: *"In writing the requirements we had gone out to the whole of the [NHO] HR services across [the country] and invited people in in groups, expert groups within various elements – recruitment, employee relations, you know, attendance and training – and we put these people in a group. So we had groups of what we call experts if you like. They formed what we called workflow groups. Now they were the experts that informed the requirement specifications for their areas so we knew exactly what it was that was needed. They also, and they still run today albeit in slightly different forms, they were also there to be the kind of expert users as we went through the conference room pilots, through into testing and so on and so forth. So if there's anything as a central team as we had here and we weren't sure what was needed, we would go and ask the expert groups to give us advice and guidance on this. And those groups, as I say, still run today."* (R2) [Quote OV-OP3]		
Implementation is coordinated centrally by the small central IT team, and locally by the HR managers: *"They also said 'well, rather than the national team be responsible for the implementation locally in the [RHOs] in the same way, the [RHOs] will take that responsibility' and the [RHOs] signed up and they said 'yeah, we'll take that, we'll do that, we'll set up the teams locally' and so on and so forth."* (R2) [Quote OV-OP4]		
Local implementation team are starved of resources "we didn't have someone specific to work on these projects, so [my colleague] and I did that along with our day jobs… So it was very time consuming, so we're trying to juggle our day job with implementing [HRIS], so it hasn't been easy." (R15 & R16) [Quote OV-OP5]		
The differences in RHOs practices are reflected in complexity surrounding the implementation of HRIS: *"Some [RHOs] have got live data in but some of the data, sets are very small so for our data, you know, our data's the equivalent of three or four other RHOs all at one time, so it's got to be spot on for us."* (R10) [Quote OV-OP6]		
Delays in data migration: "To be fair, we underestimated [data migration duration] because we didn't realise how long it was going to take." (R2) [Quote OV-OP7]		
De-prioritization of investment in non-clinical systems: *"Bearing in mind that [the new HRIS] isn't progressing very quickly across [NHO], perhaps it hadn't been prioritized against clinical systems that are needed now."* (R14) [Quote OV-OP8]		

RHOs continue to use their pre-existing HR systems in parallel with pursing the implementation of the new HRIS: *"And then we'll be able to test that we can keep the system up to date, and then the plan would be, that would allow us, assuming that the system is deemed to be completely fit for purpose, to start to roll it out to managers. And then, stop our [pre-existing HRIS] contract at a point in time where we've got the system rolled out."* (R26) [Quote OV-OP8]		
Compliance with the HRIS: *"Rather than say it's mandatory, all [RHOs] committed to sign up to it as a consortium approach, because obviously the view was we would want a common system across [NHO]".* (R10) [Quote R-Acq1]	Acquiescence	Responses
Accelerating compliance "*Originally we were in phase three but then we moved to phase two….I think we felt we were ready because things appeared to be going well and because we're a small RHO and they were keen for a small RHO, you know, to go live. So we were happy to do it at the time.*" (R15 & R16) [Quote R-Acq2]		
Seeking solutions to balance the expectations of multiple actors: "*Now if there's something that doesn't necessarily cost money but would impact other [RHOs], I've got to ask [them]…. I chair the deputy directors of HR for [NHO]. So I check with my colleagues, my deputy directors, any impacts it would have on their [RHOs]. I guess an example of that was there was an alert in the system for fixed term contracts. The alerts were set at 30 days – 90 days and then 30 days – and a couple of the [RHOs] had come to me saying that they would prefer it to sit at 120, then 30 days. So that had an impact. So I had to check with my colleagues a preference and I just went with the majority, which was now 120 and then 30 day alerts. So it's things like that, that I make sure that other [RHOs] understand the implications of changing these alerts."* (R9) [Quote R-C1]	Compromise	
Engaging in different degrees of use to balance multiple expectations "*The system has come in and what [RHOs] are doing, and this is very much my view so please treat this as my view, they're all doing something different and they're picking -, some RHOs are using bits of it, some RHOs are not using very much of it at all aside from to try and keep it up to date a bit but they're not actually using it.*" (R1) [Quote R-C2]		
Delaying progressing the implementation: *"There are three [RHOs] as I said who haven't yet migrated now they've – because payroll, they're basically sticking with the payroll interface and because the payroll interface isn't going to be delivered till October they've now delayed until kind of May/June next year."* (R2) [Quote R-Av]	Avoidance	
Dropping out of the phased implementation: *"It was going to be four [RHOs] but [one RHO] dropped out because they felt that their own system, they had their own system at the time, gave them what they needed. They felt the risk of moving to the new system, given the difficulties and the extra time they'd taken, wasn't going to immediately take over from that system, there were going to be some gaps between them. So they asked to move to a later phase so we kind of rolled out with three [RHOs]."* (R2) [Quote R-D]	Defiance	
Seeking another pilot testing and an independent evaluation to re-evaluate the actors' expectations: *"And back last summer, there was a view that it just felt we were treading water with this whole process. We weren't getting to the stage where it was getting rolled out across the [NHO] and used effectively. And we were saying, 'yeah, well, we're having similar problems.' There were just so many bits and pieces that needed to be looked at, and somebody needed to focus on working through these things. So what [central project team] agreed last summer was that it would be useful if we could get three [RHOs] who would look at the system and try and get it working end-to-end within their [RHOs]."* (R26) [Quote R-M]	Manipulation	

4. Findings

The analysis of responses, at the NHO and RHO levels, revealed four dominant institutional logics shaping the comprehension, adoption, and implementation of the HRIS innovation across the public-sector organisations. A *public-sector logic* characterised the NHO as a government institution with a remit to deliver healthcare services to the nation's citizens whilst also responsibly managing public finances; a *corporate logic* emphasised the improved efficiency and effectiveness of the NHO through better use of information; a *market logic* prioritising the competitive status of the NHO relative to international and private-sector benchmarking points, and a *professional logic* emphasised the importance of delivering high quality care to patients.

While each of these logics was evident across the three innovation stages included in the study, they prioritised different expectations, norms and sources of legitimacy, and varied in the extent to which they informed the NHO and RHO actors' behaviours during the different phases of the programme. Moreover, transitions between stages necessitated a reorientation of each prevailing logic, to preserve its currency. During the comprehension stage where the *key task involved clarifying the rationale for adoption*, all logics focused both NHO and all RHO actors' attention on the **organisational problem** that the innovation was expected to solve, and this homogeneity helped to generate buy-in to the overarching vision, across the constituents of this large and diverse national organisation - for a standardised and interoperable system that integrates all HR activities across the organisation and reflects best practices in the sector (see also Table 6). At this stage, less attention was paid to the details of the technology that would address this organisational problem and the implementation processes required to realise the vision. As the innovation progressed to adoption and the *key task shifted towards clarifying the system specifications*, the logics needed to accommodate NHO and RHO actors' expectations about the **core technologies** and their impacts on **organisational practices**, which led to changes actors' emerging organising vision of the HRIS. Actors now envisaged some form of lightly customised

off-the-shelf system that could reflect the specificity of their particular context of use. At the implementation stage, as the *key task shifted towards getting RHOs to implement and use the system in their operations*, the logics rationalised the reorganisation of **work practices** needed to transform the vision into reality. The vision now changes significantly to involve a highly customised system, with a much narrower scope of application that originally expected.

At both central and regional level, actors' ability to respond to prevalent institutional expectations and reorient their behaviours in accordance with changing priorities between stages was influenced by the degree of dissonance between the components of their organising vision for the technology. This process is described in the following sections which discuss the NHO and RHO actors' perceptions and responses during the innovation stages (see Table 7 with exemplary quotes).

4.1. Comprehension

Comprehension was marked by actors' efforts *to clarify the rational for the introduction of the new HRIS*. The *public-sector logic* dominated comprehension and was prevalent as the project unfolded. The HRIS project was triggered by the political agenda of a newly formed government and was loosely built around three objectives: to achieve accurate and timely workforce data, to rationalise HR services, and to progress IT systems interoperability across the public sector [see Quotes IL-PS1-3 in Table 7]. These government expectations focused NHO and RHO actors' attention on the specific organisational problems that the new HRIS was supposed to solve: enabling RHOs to generate standardized statutory workforce reports [Quote OV-BP1], enabling the NHO to coordinate all HR activities centrally and to improve HR management by joining (almost) all HR services into a single system, and to create interoperability between multiple HR systems and practices across individual RHOs [**business problematic**] [Quote OV-BP2]. This vision for an accurate, national and integrated HRIS solution to centrally manage all HR services

was complemented by the vision for a single, standardised system to replace the multiple local HR solutions developed across the RHOs [**core technology**] [Quote OV-CT1].

Other logics supplemented the public-sector logic in focusing actors' attention on aspects of the business problematic for the new HRIS, which remained closely aligned with the government's broad agenda for digital integration.

The *corporate logic* focused NHO attention on national-level HR processes and systems that facilitate efficient information and resource management across RHOs [Quote IL-CL1], mostly through standardising corporate processes. NHO envisaged the HRIS project to improve the efficiency of central HR departments by eliminating the need to reconcile workforce data from diverse RHO HR systems [**business problematic**] [Quote OV-BP3]. This business problematic was associated with expectations of a single technical solution that should not be customised by individual RHOs [**core technology**] [Quote OV-CT2] and used by all employees [**organisational practices**] [Quote OV-OP1].

The *market logic* drew the NHO central implementation team's attention to 'best practices' adopted elsewhere, which it sought to emulate. These were based on (a) an HRIS project in an adjacent country, which was commonly used by the NHO as a benchmark of its service quality and performance; on (b) HRIS initiatives in other large organisations (e.g. private), and (c) on other IS implementation projects within the NHO that involved standardised nationwide clinical (e.g. electronic prescribing) and administrative (e.g. finance) systems. Expectations of alignment with perceived 'best practices' [Quote IL-ML1] explained the NHO's preference for choosing a large scale, international HRIS solution that had been proven elsewhere [**core technology**] [Quote OV-CT3].

The *professional logic* was evident in the national medical association's requirements for accurate data to monitor the qualifications and registration of NHO doctors, and in the NHO's need for data to ensure a suitably skilled and capable medical workforce [Quote IL-PL1]. These

professional expectations shaped the NHO and RHO actors' interpretation of the HRIS as being interoperable with the medical association's own systems [**core technology**] [Quote OV-CT4] and aimed at improving the management of staff absences/shortages, and the recruitment and retention of medical staff [**business problematic**] [Quote OV-BP4-5].

To summarise, during the comprehension phase, multiple logics converged to focus the NHO and RHO actors' attention on agreeing the rationale for the HRIS project, thus emphasising the need for actors to clarify the organisational problem – or **business problematic -** that the new system, triggered by the government's political agenda, was supposed to address. These logics generated a coherent set of expectations around a standardised, interoperable and proven technical solution [**core technology**] that would enable NHO and RHOs to channel the government's vision, improve HR management across vastly diverse organisational units [**business problematic** & **organisational practices**], enhance the performance of the NHO by aligning with industry best practices [**core technology**], and respond to professional demands for delivering high quality health care [**core technology** & **business problematic**]. The apparent cohesion between these different components of the organising vision explains the NHO and RHO actors' willingness to conform to institutional expectations (***acquiescence*** response) and this acquiescence behaviour explains their strong shared commitment to the HRIS project during comprehension [Quote R-Acq1].

4.2.Adoption

As the project reached adoption and the NHO sought to *clarify the system specification and begin the procurement process*, the context changed significantly, with the unfolding of the financial crisis of the 2007-2008 triggering broad cost cutting measures across the public sector. The *public-sector logic* channelled these new government demands for frugality in all planned investments [Quote IL-PS4]. Due to these changed circumstances the NHO was forced to narrow its vision of what HR management problems the new HRIS could address [**business**

problematic] [Quote OV-BP6]. This required the specifications to be refocused midway through the procurement process, to prioritise core system functionalities [**core technology**] [Quote OV-CT5]. Requirements for cost cutting also changed the procurement process, with the budget, unusually, being specified in the tender documentation and a pre-qualification questionnaire being introduced prior to tendering to save costs during bid evaluation [**organisational practice**] [Quote OV-OP2]. The public-sector logic also demanded compliance with the specific equality and diversity regulations, which required strict control over access to recruitment data [Quote IL-PS5]. These expectations altered the NHO's original expectations for a standard solution, highlighting the need for some limited customisation of any off the shelf solution, for example in terms of introducing options to hide candidates' sex and age data to the recruiting manager, to ensure regulatory compliance [**core technology**]. [Quote OV-CT6]

These changes in the envisaged scope of the HRIS, reflecting the new frugal public-sector logic, gradually shifted out of synch with the corporate and professional logics whose influence became more apparent during adoption.

At the comprehension stage the *corporate logic* had also prioritised the achievement of efficiencies through standardising HR management practices, generating expectations for a fixed solution. However, during adoption the RHOs and NHO efforts to agree on system specification led to recognition that HR services and needs vary significantly across RHOs depending on the contexts in which their employees operate [Quote IL-CL2]; for example geographically dispersed rural RHOs compared with urban RHOs. As such, it become apparent that full standardisation runs the risk of reducing the quality of the HR services RHOs offer to their employees. The corporate logic thus shifted at this stage from creating expectations for a standard system to envisioning a solution involving some degree of customisation to local RHO requirements [**core technology**] [Quote OV-CT7], in contrast with the public-sector logic which focused expectations on a narrow, no-frills, core functionalities solution.

During adoption, the *professional logic* was manifested in the efforts of the NHO central implementation team to achieve consensus amongst diverse NHO actors and ensure broad buy-in to the new HRIS [Quote IL-PS2]. This led to extensive engagement and consultation across the whole spectrum of audiences during adoption, to elicit requirements [**organisational practices**] and build system specifications [**core technology**] [Quote OV-OP3]. This again conflicted with the public-sector institutional logic, which favoured an off-the-shelf technical solution with minimal potential for local customisation.

The *market logic* was evident in expectations within the NHO about benchmarking the IS initiative against comparable initiatives elsewhere. During comprehension this logic had focused the NHO team' attention on seeking alignment with perceived best practices, while during adoption the emphasis shifted, with the NHO keen to differentiate this HRIS project with the neighbouring country's payroll-led HRIS implementation project [Quote IL-ML2]. This shift helps to explain the NHO's preference for a HR-led system, which it was felt would better suit their requirements and context [**core technology**] [Quote OV-CT8].

To summarise, as the project moved from comprehension (clarifying the rationale for the project), to adoption (clarifying system specification and procurement of a suitable system), the NHO and RHOs actors' efforts shifted from envisaging the **business problematic** the HRIS would solve to clarifying the **core technology** this would require, to identifying the **organisational practices** that would be required to achieve this solution. Despite tensions arising from a shift in the vision developed for the **core technology** associated with the HRIS (broad and standardised versus narrow and customisable), there was little effort to revisit and refine the **business problematic**, beyond acknowledging the reduced scope of the project. The business problematic was now misaligned both with the new expectations for customisable technology and the practices involving extensive (and time consuming) consultation processes that emerged during adoption. This dissonance between and within the components of the organising vision explained the

change in NHO and RHOs' response from acquiescence to ***compromise*** [Quote R-C1]. Compromise explains the slowing down of the project at this stage, as HR professionals tried to convince the NHO to delay the implementation process to give them time to reconcile these competing expectations, while the central NHO team sought agreement among RHOs, other NHO actors (government representatives) and the IT vendor.

4.3.Implementation

Implementation was marked by a shift in the focus of actors' efforts towards *the introduction of the system within RHOs, and its use to support their HR practices*. Implementation was to be coordinated centrally by the central NHO-based implementation team, while all local implementation activities, such as data migration, testing, training and change management, were to be undertaken by individual RHOs.

The *public-sector* logic of cost efficiency continued as a dominant influence shaping the organisational practices involved in the implementation process. Requirements for frugality across the public-sector operations meant that both the NHO and the 22 RHOs were provided with little or no additional staffing resources to support the new system implementation. Local implementation teams thus comprised mainly existing HR full time staff, who were expected to manage the additional work in addition to their normal full-time responsibilities [**organisational practices**] [Quote OV-OP4-5].

During implementation, the *corporate logic* around effective management shifted in emphasis from specifying the core technology to clarifying the organisational practices associated with its introduction and use in RHOs, particularly those around data migration required by the implementation of the new system. With significant differences in organisational size and historical data management practices hampering the RHOs' ability to follow the prescribed data migration approach, which assumed standardised data [Quote OV-OP6], it quickly became

evident that the 6-month plan for migrating to the new system was unrealistic [**organisational practices**] [Quote OV-OP7].

Juxtaposed with the public-sector cost cutting pressures, *professional logics* prioritizing clinical over administrative systems shaped the central and local HRIS implementation teams' interpretations of the NHO decision to cut funding for HRIS project delivery [Quote IL-PL3]. With no new staff hired to support the delivery of the HRIS project, implementation fell to existing full-time staff, significantly slowing down the process [**organisational process**] [Quote OV-OP8]. Aware of the low priority given to HR systems, HR professionals sought to re-frame the HRIS as a 'strategic management system' whose scope extends beyond HR activities to improving the quality and effectiveness of care, thus aligning with professional and corporate logics [**business problematic**] [Quote OV-BP7].

The *market logic* proved the most influential at this stage in shaping how the NHO and RHOs evaluated the use of HRIS, based on expectations about its potential to deliver competitive, high quality services to their customers (e.g. employees and candidates) [Quote IL-ML3], rather than its alignment with government vision (cf. public-sector logic) or compliance with the NHO mandate (corporate logic). The RHOs' vision for a customisable system that delivers a high-quality HR service to their employees conflicted with the post-austerity 'no frills' core service prioritised by the NHO, resulting in no dedicated resources being provided and data migration delays. These tensions became more evident as implementation proceeded in early RHO adopter sites, explaining RHOs' concerns that the new system might be unable to meet their HR needs, or be inferior to their existing HRIS [**business problematic**] [Quote OV-BP8]. These tensions and uncertainties led many RHOs to run both systems in parallel [**organisational practices**] during the project [Quote OV-OP8].

As the project moved from adoption (with a focus on clarifying specifications) to implementation (with a focus on data migration and actual use), RHOs and NHO actors' attention shifted to

clarifying the organisational practices associated with HRIS. Tensions between the organising vision components that had emerged during adoption now became entrenched as changes in project specifications resulted in mismatching expectations of the RHOs and NHO regarding the business problematic and core technology. The project narrative at this stage reflected a de-prioritisation of the innovation, disinvestment and rationalisation of the implementation resources both at NHO level, and within individual RHOs [**organisational practices**]. These austere practices were in dissonance with the initial vision NHO and RHOs had for a broad, nation-wide, modular and digitally integrated HR system with strong government commitment, aligned with industry best practices, and delivering a wide range of benefits to all. Consequently, the RHOs' vision of the business problematic addressed by the new HRIS - improved ability to deliver HR related tasks, narrowed down dramatically [**business problematic**], with activities now focused on de-risking the transition by concurrently running the new and old systems.

To respond to this dissonance, RHOs enacted a range of ***strategic responses***, which varied according to their stage of involvement (earlier versus later adopter) and on their context (size and the presence of a pre-existing electronic HR system). In the early stages of implementation, most RHOs, especially those without pre-existing HRIS, decided to accelerate their ***acquiescence*** by asking to move faster with the project [Quote R-Acq2]. As the implementation proceeded, organising practices clarified and begun to reveal the dissonance with the core technologies and business problematic, leading to an increase in the variety of responses exhibited by the RHOs. Most of the later stage RHO adopters followed a ***compromise*** response, engaging in different approaches to implement the system in an effort to balance various institutional demands [R-C2]. Examples include requesting multiple adaptations to better align the system with their current HR practices, or limiting their exposure to the system by introducing it only within their HR departments, in small pilots outside of HR; or by making its utilization voluntary. A number of RHOs insisted on implementing only modules that they were happy with, whilst continuing to

rely on their existing HRIS for other functions, arguing that some of the new HRIS modules are not fit for purpose. In addition to these compromise responses, other RHOs, including those which had previously conformed to the NHO's expectations and engaged with the system, now openly engaged in ***defiance*** by withdrawing from implementation, in some cases even after substantial investments had been made in data migration [Quote R-D]. The most common response, however, was ***avoidance***, as most RHOs decided not to complete their scheduled implementation activities until the system had been proven in other RHOs [Quote R-Av].

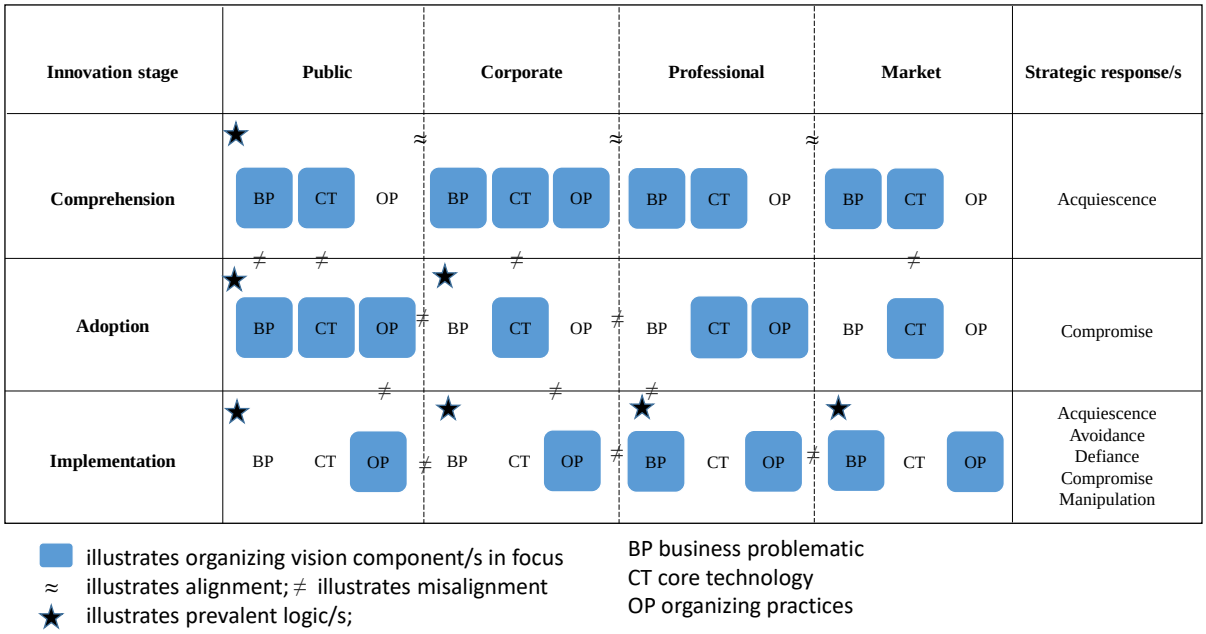
Mounting government demands to continue with implementation meant that ***compromise*** responses were largely unsuccessful in reconciling dissonant perceptions of the organising vision, while ***defiance*** and ***avoidance*** strategies were difficult to maintain. Without an obvious means of resolution in sight, some RHOs adopted a ***manipulation*** response to try to resolve these dissonant perceptions, including efforts to change the expectations surrounding the deployment of the HRIS by requesting that the central implementation team undertake a pilot to identify which parts of the system were fit-for-purpose [**core technology**] and then generate a list of best practices for system implementation and use [**organisational practices**], reflecting the new, narrower vision for the system [**business problematic**]. This request was accommodated by the central team [Quote R-M], and the pilot finished mid-way through this study's data collection. Most respondents expected the implementation to continue regardless of the outcome of the pilot, due to the large financial investment already made and the government's strong commitment to the system. While waiting for the results of the pilot, all but one RHOs where system implementation was underway delayed the project's progression.

5. Discussion

Research examining the implementation of transformative IT projects in institutionally complex settings highlights both the multiplicity of logics that characterise such environments (Berente and Yoo, 2012; Currie and Guah, 2007), and the shifting envisioning of the technology by

organisational actors as the project unfolds (Abubakre *et al.*, 2017; Robey and Azevedo, 1994). To bridge these levels, our interpretative framework draws on the concepts of *institutional logics*, *organising vision*, and *strategic responses* to examine how actors' responses to institutional complexity and their emerging interpretations of technology interact to shape the outcome of an IT implementation project. The findings are summarised in Figure 1 below (see also Table 6) and discussed in the rest of the section.

Figure 1. Visual representation of the findings



A growing literature examining IT implementation projects in institutionally complex settings suggests that tensions between multiple logics shape the outcome of such projects. An important assumption here is that such tensions arise as different socialised actors operating within the same environment draw from different logics to guide their behaviour (e.g. Boonstra *et al.*, 2017), forcing them to engage in coping behaviour to address these tensions (e.g. Currie and Guah, 2007). This coping behaviour – actors' responses to institutional complexity – explains the outcome of IT implementation projects, for example the successful adaptation of standardised technology when coping resolves tensions between multiple logics (e.g. Berente and Yoo, 2012),

or implementation failure when coping fails to reconcile conflicting logics (Mangan and Kelly, 2009).

In contrast, this case study reveals that although the multiple institutional landscape remains similar throughout the stages involved in the digital transformation project, actors change how they respond to this contextual complexity by emphasising different sets of logics at different times. This emphasis varies depending on the key task actors focus on at different stages during the project life cycle: envisioning the technology application during comprehension, when the rationale for adoption has to be agreed upon; clarifying the core technology as embodied in the system specifications that are negotiated as the technology is being procured during adoption; and considering the organisational practices involved during implementation as the technology is introduced into use. Moreover, changes in the nature of the task actors focus on at different stages during the innovation project means that the same institutional logics may direct actors' attention onto different aspects of the organising vision at different times. For example, in the case studied here, the emphasis of market logic during comprehension was alignment with best practice but shifted to differentiation (e.g. from competitors or other HRIS projects) during adoption. The relative influence of specific expectations associated with different institutional logics in guiding actors' behaviour varied across the project not, as expected, because of the involvement of multiple actors socialised differently (Boonstra *et al.*, 2017), but because of the shift in the task actors focused on during different stages. Most institutional expectations were in fact present throughout the stages, but only became salient to the actors involved once the focus of the project moved through the stages from comprehension to delivery, highlighting misalignments that had hitherto been underplayed or worked around. Moreover, in this case, the key tensions were not among the logics themselves, as reported in previous studies (Berente and Yoo, 2012; Bunduchi *et al.*, 2015; Currie and Guah, 2007), but among the interpretations actors develop concerning different components of the technology's organising vision: its business

problematic, core technology and organisational practices. For example, shared expectations about efficiency (dominated by corporate logic) led to a vision for a standardised central system during comprehension, whereas the priority shifted towards customisation during adoption, as the challenges of embedding the system within the organisation became apparent.

This project considered not only the institutional complexity that actors must cope with, but also their efforts to interpret, make sense of and envision different aspects of a new, unfamiliar technology as its implementation unfold. The findings suggest that in institutionally complex settings, IT implementation project outcomes result from the interaction between the visions the actors form about the technology and their coping behaviour to resolve this complexity. Thus, it is not institutional complexity alone that shapes how actors behave and implement technology and with what outcomes, as described in existing research (e.g. Berente *et al.*, forthcoming). Rather, actors' coping behaviour emerges as they envisage different aspects of the technology in response to both institutional complexity and the nature of task to which the focus of their attention is directed at different project stages. In this study, coping strategies arose due to dissonance between the competing visions actors had formed about different aspects of the technology involved in the digital transformation project – its organisational application, core technology and work practices - rather than due to tensions between logics themselves.

Cultural studies of IT implementation find that the level of alignment or conflict in vision between different groups of actors is critical for explaining the use of IT following implementation (Abubakre et al., 2017). This has been attributed to misalignment between the values embedded in the IT and those associated with different actors' contexts (Leidner and Kayworth, 2007). In the digital transformation project studied here, actors' envisioning of the business problems, technology solutions and organisational practices was not simply an outcome of the implementation process, as suggested by cultural studies of IT, but played a key role in shaping the focus and outcomes of the project. Actors' emerging visions of the organisational application

of IT act as an intermediary (mezzo level) between multiple logics (the macro level) and actors' coping responses (the micro level) in shaping the outcome of and the process involved in the implementation as the project unfolds. Importantly, this study highlights the pivotal role played by the type of task involved during implementation stages, which focuses directs the attention on different components of the actors' emerging vision as the implementation unfolds.

Existing IS research also suggests that variation in actors' responses arises due to the varying levels of authority of different organisational actors that exist across a project's lifetime (Standing et al., 2009) and the degree of congruence between logics themselves (Berente et al., forthcoming). However, it says little about what could explain such variation when the level of authority and the tensions between logics remain similar, as was the case in this study. Here, the dissonance between actors' perceptions of the different components of the organising vision (business problematic, core technology, organisational practices) explained their coping strategies. These were acquiescence in the case of great cohesion (at comprehension), compromise when dissonance first appeared (at adoption), and the whole repertoire of responses ranging from avoidance to manipulation as the dissonance between expectations deepened and misalignments became more obvious (at implementation). Thus, these findings not only explain why conflicting visions of technology emerge between different groups of actors (Abubakre et al., 2017) but also elucidate their consequences as the project unfolds. They also reveal the role played by congruence within the vision of the *same* group of actors, as much as congruence among the visions held by different actors (e.g. Abubakre et al., 2017; Currie, 2004; Swanson and Ramiller, 1997) in shaping IT adoption and implementation. Organising vision thus emerges as a useful concept for investigating how actors cope with institutional complexity in large-scale digital transformation projects by delineating the different aspects of such technology implementation projects (scope of application, technology and practices) that require alignment throughout the different stages.

6. Conclusion

The struggle to cope with tensions between multiple logics, and the difficulties involved in aligning diverse and shifting interpretations of the technology across diverse groups of actors, characterise many IT implementation projects in complex settings (e.g. Berente and Yoo, 2012; Currie, 2012). This analysis demonstrates how actors' efforts to cope with complex IT implementation initiatives result from the interaction between the multiple institutional logics guiding their behaviour and their shifting interpretations and expectations of the projects' objectives, technological scope and required actions ('organising vision') as the implementation project unfolds and changes in the nature of the task at hand. While other research has pointed to the role of institutional logics and tensions between actors' interpretations in shaping IT implementation process and outcomes (e.g. Abubakre *et al.*, 2017; Berente *et al.*, forthcoming), this analysis is unique in three main ways. Firstly, by showing how the *relative* influence of different logics (here, public sector, corporate, professional) and elements of the organising vision can change as the nature of key task changes during project's progression from comprehension to implementation. Secondly, by demonstrating the importance of coherence of visions *within* groups of actors as well as between them. Thirdly by revealing how actors' *visions* of a project's business problem, technology solution and organisational practices *shape their coping responses* to institutional complexity during IT implementation.

The study contributes to current institutional IS research which sees the actors involved in technology implementation projects as active players who can interpret institutional expectations and strategically act upon these interpretations to shape the project, rather than being passive followers of institutional templates for action (e.g. Berente *et al.*, forthcoming; Orlikowski and Barley, 2001). We move beyond current IS research that explains actors' behaviour during IT implementation as arising from institutional complexity (e.g. degree of congruence between logics (Berente *et al.*, forthcoming), level of authority (Standing *et al.*, 2009), or pattern of

socialisation (Boonstra *et al.*, 2017). Instead, the findings highlight the role played by actors' "organising vision" (collective interpretation of a new technology introduced within their organisation) in shaping their coping responses, and how these responses can influence the processes and outcomes of IT implementation projects in complex institutional settings.

These findings also have implications for policy and practice. Large-scale digital transformation projects are taking place worldwide, often at great expense. The institutional complexity characterising modern organisational settings helps to explain why such projects often experience difficulties (Currie, 2012). Effective planning and management of such projects may be aided by understanding how this complexity can shape actors' responses, and how to ensure that the organising vision for the innovation is universally understood, cohesive and stable over time. This study finds that there is a need to account not only for differing institutional logics, but also their changing influence as the project progress through stages and actors' attention is directed onto different aspects of the organising vision. These results illustrate the need to recognise these changes and seek alignment before conflicting viewpoints become entrenched.

The study is not without limitations. It focuses on the project stages up to and including implementation and does not consider how the interplay between logics and actors' responses shaped the outcomes of the programme after the system had been fully rolled out. The analysis considers only one organisation (albeit comprising many regional organisations) in one sector (healthcare), hence the specific relations observed here between logics, organising vision and responses may not necessarily be transferable to other settings. For example, it is unlikely that all implementation projects will experience the same increase in response variety over time, while institutional logics will vary with context (for example, the public sector logic found here, is unlikely to apply in industry). A fruitful avenue for future research would be to explore the applicability of the framework to other settings outside healthcare, both in the public and private

sectors, as well as to consider how the level and stability of coherence within the organising vision shapes the success of digital transformation projects throughout their use.

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Appendix

Table 4. Respondents

Organization/Team	Respondents	Code	Involved since
Central HRIS team	National Project Team Respondents	R1, R2, R3	Comprehension
eHealth Division	eHealth Respondent	R4	Implementation
Procurement Team	Senior Procurement Respondent	R5	Adoption
Vendor	Key Project Participants	R6 R7	Adoption Implementation
System Supplier	Key Project Participant	R8	Not available
RHO 1	Senior HR Executive	R9	Adoption
RHO 2	Senior HR Executive	R10	Comprehension
RHO 3	Senior HR Executive Implementation Team Member HR Professional	R11 R12 R13	Comprehension Implementation Implementation
RHO 4	Senior HR Executive	R14	Adoption
RHO 5	HR Professionals	R15, R16	Adoption
RHO 6	Senior HR Executive HR Professionals	R17 R18, R19	Adoption Implementation
RHO 7	Senior HR Executive HR Professionals Manager User	R20 R21, R22, R23, R24 R25	Implementation Implementation Implementation
RHO 8	Senior HR Executive Implementation Team Members Employee User	R26 R27, R28, R29, R30 R31	Comprehension Implementation Implementation

Table 5. List of documentation

Publicly available information concerning the NHO & HRIS project
[Country] eHealth strategy
NHO website
Project website
[Country] Shared support services project description

(Relevant) News
HRIS project specific documentation
Workforce information systems strategy report
[HRIS] eHealth outline business case
[HRIS] eHealth project. Standard business case
[Country] Workforce information strategic system. Short term solution–phase 1&2 implementation proposal
[HRIS] Services specification
Project Gantt chart
Procurement documentation (e.g. invitation to tender documentation, pre-qualification questionnaire)
End of [HRIS] pilot national implementation board report [commissioned in 2014]
Pilot project. iRecruitment review report
Pilot project. Using [HRIS] – lessons learned report
RHOs [HRIS] local implementation plans
System training materials (e.g. [HRIS] Self service awareness session, employee quick reference guide)